

STATINTL

24 July 1961

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Washington, D. C.

Dear Chris:

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The enclosed report outlines the discussion of our meeting at [REDACTED] on Thursday, 20 July 1961, regarding Edge Detection Techniques. In accordance with your request, a discussion of the Image Correlator is also included.

Sincerely,

STATINTL

R-m

enc.

Meeting Report

IMAGE CORRELATOR

As was previously discussed, the Image Correlator consists of eight film planes located symmetrically about the optical axis of the CRT-camera optical system. Each film plane has vernier adjustment for angle and displacement. All eight film planes are scanned simultaneously, but only two at a time are correlated. The correlation is done in such a fashion as to yield a null or minimum when alignment is achieved. The correlation is to be made for one second periods (about 100 scans). The voltage of the capacitor, used for integration, is to be presented as a one second sweep on an oscilloscope. This one second corresponds to one complete raster. It can be shown that a curved trace represents angular misalignment with the direction of curvature indicating the direction of the misalignment. Similarly, with angular misalignment corrected, a straight line trace with a non-zero slope shows a misalignment in the direction of scan with the sign of the slope indicating the direction of error.

When alignment is achieved each photo-multiplier is essentially replaced by a lamp and the CRT by a camera, and a single exposure is made from all eight film planes.

EDGE DETECTION

Initial experiments for the feasibility of the edge detection apparatus will use the scanning head of the Image Correlator. Two photographic ramps will be placed at two stations and a picture with an edge within it at a third station. The output of a scan made roughly parallel to the edge will be correlated separately with the scan of the photographic ramps, one increasing in density while the other decreases. The results of the two correlations (multiplication and integration of the product over a single frame of the raster) will be differenced to yield a null when the scan is parallel to the edge.

Following these experiments a breadboard based on information obtained from the correlator will be constructed. This will provide a means of optically locating the region to be scanned and vernier adjustment of the scan relative to the edge. The outputs will consist of a null detector to indicate that the scan is parallel to the edge, a display of the average edge profile (a display of the average transmission of each scan as a function of distance), and a TV picture of the scanned region. Measurement between edges can be made by use of the profile display and the vernier adjustment.

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should talk to



say about 1 Sept. 1961.
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